

REMARKS

Applicants request favorable reconsideration and allowance of the subject application in view of the preceding amendments and the following remarks.

Applicants note that the Examiner has considered some of the information cited in the Information Disclosure Statement filed on February 27, 2003, since he has initialed the cited U.S. patent and has signed and dated that paper at the bottom. Applicants note, however, that the Examiner has inadvertently not initialed the Japanese document, which was cited in that Information Disclosure Statement, indicating his consideration. Accordingly, Applicants request that the Examiner initial that document, as well, and return a copy of the initialed PTO-1449 form together with the next official action.

Claims 65-77 are presented for consideration. Claims 65 and 70 are independent. Claims 66-70 and 72-76 have been amended to clarify features of the subject invention, while claim 77 has been added to recite additional features of the subject invention. Support for these changes and this claim can be found in the original application, as filed. Therefore, no new matter has been added.

Applicants request favorable reconsideration and withdrawal of the objection and rejections set forth in the above-noted Office Action.

Claims 67, 68 and 72-75 were objected to due to minor informalities. Specifically, the Examiner noted a lack of antecedent basis for the terms "said unit" or "said optical unit." To expedite prosecution, Applicants have amended these claims in light of the Examiner's comments. Specifically, the noted terms have been changed to -- the optical element --,

providing proper antecedent basis. Accordingly, Applicants request reconsideration and withdrawal of the Examiner's objections to these claims.

Claims 70-76 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Examiner asserted that these claims were incomplete for omitting "essential elements." Applicants respectfully submit that breadth does not necessarily equal indefiniteness. Nevertheless, to expedite prosecution, Applicants have amended independent claim 70 by taking into account the Examiner's comments. Specifically, as now recited in independent claim 70, the exposure apparatus includes, among other features, an illumination system, a projection system and an optical element. Applicants submit that these changes overcome this rejection. Such favorable indication is requested.

Turning now to the art rejections, claims 65, 67-70, 72, 73 and 75 were rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 5,349,604 to Nakata. Claim 66 was rejected under 35 U.S.C. § 103 as being unpatentable over the Nakata patent in view of U.S. Patent No. 5,028,697 to Yamada et al. Claim 71 was rejected under 35 U.S.C. § 103 as being unpatentable over the Nakata patent in view of U.S. Patent No. 4,358,198 to Moriyama et al. Claims 74 and 76 were rejected under 35 U.S.C. § 103 as being unpatentable over the Nakata patent in view of U.S. Patent No. 5,668,672 to Oomura. Applicants submit that the cited art, whether taken individually or in combination, does not teach many features of the present invention, as previously recited in claims 65-76. Therefore, these rejections are respectfully traversed. Nevertheless, Applicants submit that independent claims 65 and 70, as presented, amplify the distinctions between the present invention and the cited art.

In one aspect of the invention, independent claim 65 recites an illuminator that includes an illumination system which illuminates a surface to be illuminated with luminous light from a light source. The illumination system has one optical element, which has a titanium oxide film formed on only the periphery of its surface.

In another aspect of the invention, independent claim 70 recites an exposure apparatus that includes an illumination system for illuminating a pattern on a mask with luminous light from a light source, a projection system for projecting the pattern onto a wafer, and an optical element, which has a titanium oxide film formed on only a periphery of its surface.

Applicants submit that the cited art, whether taken individually or in combination, does not teach or suggest such features of the present invention as recited in independent claims 65 and 70.

The Examiner takes the position that the Nakata patent discloses an illuminator that includes an illumination system which illuminates a surface to be illuminated with luminous light from a light source, wherein the illumination system has one optical element, which has a titanium oxide film formed on only the periphery of its surface. Applicants submit, however, that the Nakata patent discloses, in column 1, lines 23-46, and as shown in Figure 1, that non-uniformity of a beam intensity is caused by reflection of a laser beam on a second surface S2 of lenses 2. The reflection prevention process for preventing this non-uniformity is carried out by applying to the lenses 2 a multi-layer coating that includes magnesium fluoride and titanium oxide. Applicants submit that according to the invention in the Nakata patent, a multi-layer coating is applied to the lenses 2 for the purpose of not only preventing the reflection of the beam at the point where

the component A enters the surface S2 of the lenses 2 (as depicted in Figure 1), but also for not reflecting the beam on other spots of the surface S2. Applicants submit that when a multi-layer coating is applied in this manner, it would be conceivable and expected that the coating be applied to the entire surface area of the surface S2. Applicants submit, therefore, that the Nakata patent does not explicitly teach or suggest the salient features of the present invention recited in independent claims 65 and 70, in which an illumination system has one optical element, which has a titanium oxide film formed on only the periphery of its surface. Accordingly, the Nakata patent does not teach or suggest the salient the features of Applicants' present invention as recited in those independent claims.

Applicants further submit that the remaining art cited does not cure the deficiencies noted above with respect to the Nakata patent.

The Examiner relies on the Yamada et al. patent for disclosing that a laser should be an ultraviolet laser because ultraviolet lasers increase resolution.

The Examiner further relies on the Moriyama et al. patent for disclosing a supporting unit having titanium oxide on it in order to improve performance.

In addition, the Examiner relies on the Oomura patent for disclosing a mirror used in an optical system of a scanning exposure apparatus for directing light onto a mask and a wafer.

Applicants submit, however, that none of the Yamada et al., Moriyama et al. and Oomura patents teaches or suggests the salient features of Applicants' present invention as recited in independent claims 65 and 70, which have been discussed above. Namely, those patents do not teach or suggest anything regarding an illumination system having one

optical element, which has a titanium oxide film formed on only the periphery of its surface. Accordingly, that art adds nothing to the teachings of the Nakata patent that would render obvious Applicants' present invention recited in independent claims 65 and 70.

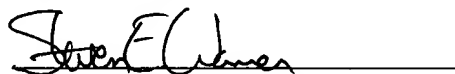
For the foregoing reasons, Applicants submit that the present invention, as recited in independent claims 65 and 70, is patentably defined over the cited art, whether that art is taken individually or in combination.

Dependent claims 66-69 and 72-77 also should be deemed allowable, in their own right, for defining other patentable features of the present invention in addition to those recited in their respective independent claims. Further individual consideration of these dependent claims is requested.

Applicants further submit that the instant application is in condition for allowance. Favorable reconsideration, withdrawal of the objection and rejections set forth in the above-noted Office Action and an early Notice of Allowance are requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our address listed below.

Respectfully submitted,



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